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Research Note

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OGDEN UTAH

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GROWTH OF SINGLE BITTERBRUSH PLANTS VS. MULTIPLE GROUPS ESTABLISHED BY DIRECT SEEDING^{1/}

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Bitterbrush (Purshia tridentata, Pursh.) is currently the most useful browse species available for revegetating depleted winter rangelands for deer in southern Idaho. In recent years considerable effort has been expended to learn satisfactory methods of establishing bitterbrush by direct seeding.

On steep slopes where mechanized equipment cannot be operated, bitterbrush has been seeded by hand methods. Small seedbeds, approximately 2½ feet square, are prepared by scraping the surface 2 inches of soil to the downhill side of the seedbed to eliminate existing vegetation and weed seed. These seedbeds are called scalps. Six to 12 seeds are planted approximately 1 inch deep at each of three spots within each scalp by a handplanter.^{2/} This procedure results in a wide range in numbers of seedlings emerging from individual seed spots. By the end of the first growing season, during which many seedlings succumb to the hazards of environment, some seed spots contain a single young plant while others contain several.

Growth rates of young bitterbrush plants established by this seeding method were measured to determine whether two or more plants growing from a single seed spot furnished as much browse as single plants. Only those scalps containing but one successful seed spot at the end of the first growing season were used for this comparison. Data were obtained in 1961 from three sites in Boise County, which had been seeded in the fall of 1956 and subsequently sampled for seedling establishment and survival.

^{1/} Material reported herein was part of a cooperative study by the Intermountain Forest and Range Experiment Station of the U.S. Forest Service and the Idaho Fish and Game Department through Federal aid to Wildlife Restoration Project W-111-R.

^{2/} Holmgren, Ralph C., and Joseph V. Basile. Improving southern Idaho deer winter ranges by artificial revegetation. Idaho Fish and Game Dept. Wildlife Bul. 3, 61 pp., illus. 1959.

Average maximum height and average diameter of the plant crown were measured to the nearest inch. Multiple plants were measured as though they were one. In fact, only by careful examination of the stems near the soil surface could the exact number of plants growing from a spot be determined.

RESULTS AND DISCUSSION

Measurements for 59 single and 52 "multiple" plants are shown below.

Table 1.--Average maximum height and average diameter of single bitterbrush plants and multiple plant groups at three sites, Boise County, Idaho, 1961

Site	Number	Single plants		Multiple plant groups		
		Average maximum height	Average diameter	Number	Average maximum height	Average diameter
		(inches)	(inches)		(inches)	(inches)
1	7	19	17	5	16	16
2	21	15	14	12	15	14
3	31	16	14	35	18	18
Mean (59 measurements)		16	14	Mean (52 measurements)		
					17	17

Browse production, as reflected by the size of plants after five growing seasons, was similar regardless of whether one plant or several had become established in a seed spot. After 5 years, 35 of the 52 "multiple plant" spots contained two plants, 11 contained three plants, five contained four plants, and one contained five plants.

When two or more shrubs become established from a single seed spot the branches intermingle in the interior of the canopy. What effect this crowding of the branches may have upon ultimate growth and productivity is not known.

Additional data from these same sites show that: of seed spots having only one seedling at the end of the first summer, 50 percent still contained a living plant after 3 years; and of those containing more than one seedling at the end of the first summer, 75 percent still contained at least one plant after 3 years. Thus, from the standpoint of plant survival, establishment of more than one plant per seed spot appears to be advantageous. This would approximate conditions often found in natural reproduction of bitterbrush, where plant establishment results from large seedling groups emerging from rodents' caches.

On the basis of survival and growth rates observed over the past 5 years, establishment of several seedlings per seed spot should be aimed at in applying the "scalping" method of seeding bitterbrush under southern Idaho conditions.